Epidemiology of Group C Meningococcal Disease in the US and Other Countries

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Disease caused by *Neisseria meningitidis*, or meningococcal disease, is a leading cause of bacterial meningitis and sepsis in the United States, and globally. *N. meningitidis* is unique among major causes of bacterial meningitis for its ability to cause epidemics as well as endemic disease. Meningococci are classified into serogroups based on immunologic characteristics of their capsular polysaccharides. In the United States in 1997-98, serogroups C, B, and Y meningococci account for 95% of invasive disease; most of the remaining cases are caused by serogroup W-135. Although serogroup A meningococci remains an important cause of endemic and epidemic meningococcal disease in Africa and other parts of the world, there have been no confirmed indigenously acquired serogroup A meningococcal disease cases in the United States for more than a decade.

Large periodic epidemics of meningococcal disease occurred in the United States in the pre-WWII era. Since this time the overall rates of disease have gradually declined to the current level of 0.8 to 1.3 cases per 100,000 population, a rate correlating with the occurrence of approximately 2,300 to 3,400 cases per year. Case-fatality rates for meningococcal diseases in the United States remain quite high at about 12% despite the continued sensitivity of most meningococci to a wide range of commonly available antibiotics, including penicillin.

Although overall rates of meningococcal disease in the United States have remained relatively stable, there have been important changes in meningococcal disease epidemiology over the last decade. One of these changes is the increased number of localized outbreaks that have occurred in the United States. These outbreaks have been distributed widely over the U.S., and have been predominantly caused by serogroup C meningococci. Most of these outbreaks have involved fewer than 10 cases in communities or organizations (e.g., universities), but have resulted in a clear increase in use of mass vaccination campaigns with the currently licensed quadrivalent polysaccharide meningococcal vaccine (A/C/Y/W135) for control of disease . Another important change in the epidemiology meningococcal disease is the increase in the proportion of invasive disease due to serogroup Y meningococci. In 1989-91, serogroup Y meningococci accounted for 2% of invasive meningococcal disease cases, but during the most recent part of this decade has risen to account for a full one-third of disease.

There has been an important shift in age-specific attack rates of meningococcal disease in the United States. Traditionally, children under 2 years and 2-5 years of age have been at the highest risk for disease but over the last decade, rates of disease in older children and young adults have risen gradually to the point that they now approximate those in children 2-5 years of age.

Lastly, in the Pacific Northwest, involving Oregon and parts of Washington, there has been an epidemic of serogroup B meningococcal disease resulting in peak attack rates almost 5-fold higher than the U.S. national rates of disease. This epidemic was caused by a particular clonal group of bacteria known as "ET-5" (based on its characteristic multilocus enzyme electrophoresis pattern) that has caused similar epidemics over the last several decades in Europe, Cuba, and South America. Rates of meningococcal disease in the United States have remained relatively stable over the last decade but there have been important changes in its epidemiology. Meningococcal disease is an important public health priority for improved control because of its epidemic potential, high case-fatality rate, its impact on children and young adults, and the need for public health response to every case to prevent secondary transmission. Conjugate meningococcal vaccines for serogroup C meningococci and other meningococcal serogroups represent an important opportunity for improved control of meningococcal disease in the United States, and globally.